(12) UK Patent Application (19) GB (11) 2 053 088 A

(21) Application No 8019616
(22) Date of filing
16 Jun 1980
(30) Priority data
(31) 2925400
(32) 23 Jun 1979
(33) Fed Rep of Germany
(DE)
(43) Application published
4 Feb 1981
(51) INT CL³ B27B 11/10
(52) Domestic classification
B5L 104 CP
(56) Documents cited
None
(58) Field of search
B5L
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(54) Clamping arrangement for a sawing machine

(57) A sawing device has a movable supporting platform (4) for moving the material (32) to be cut to the blade (1). A clamping arrangement for the material comprises a support (12, 13) towards each end of the platform (4), each support having upper and lower crosspieces (18, 19 and 20, 21 respectively). A bar (15a, 15b) extends vertically between each pair of crosspieces and a rail (26) extends between the bars (15a, 15b) to be clamped thereto at a selected position. A torsion bar (29) extends between the upper crosspieces (18, 19) and has eccentric cams (30) engagable with the upper ends of the bars (15a, 15b) for movement thereof.

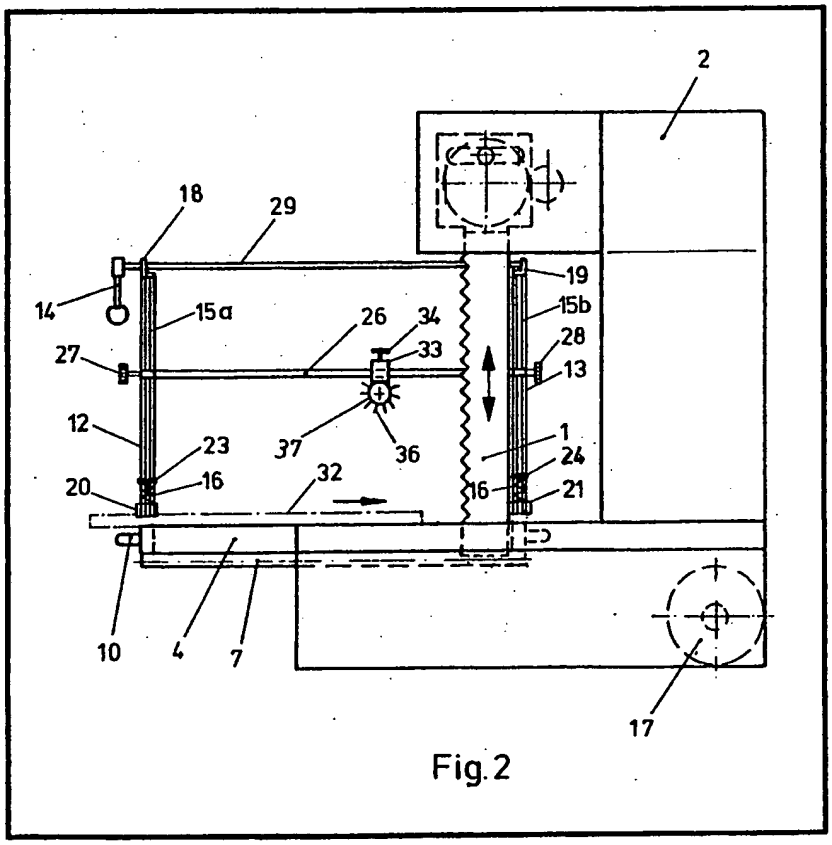

Fig.2

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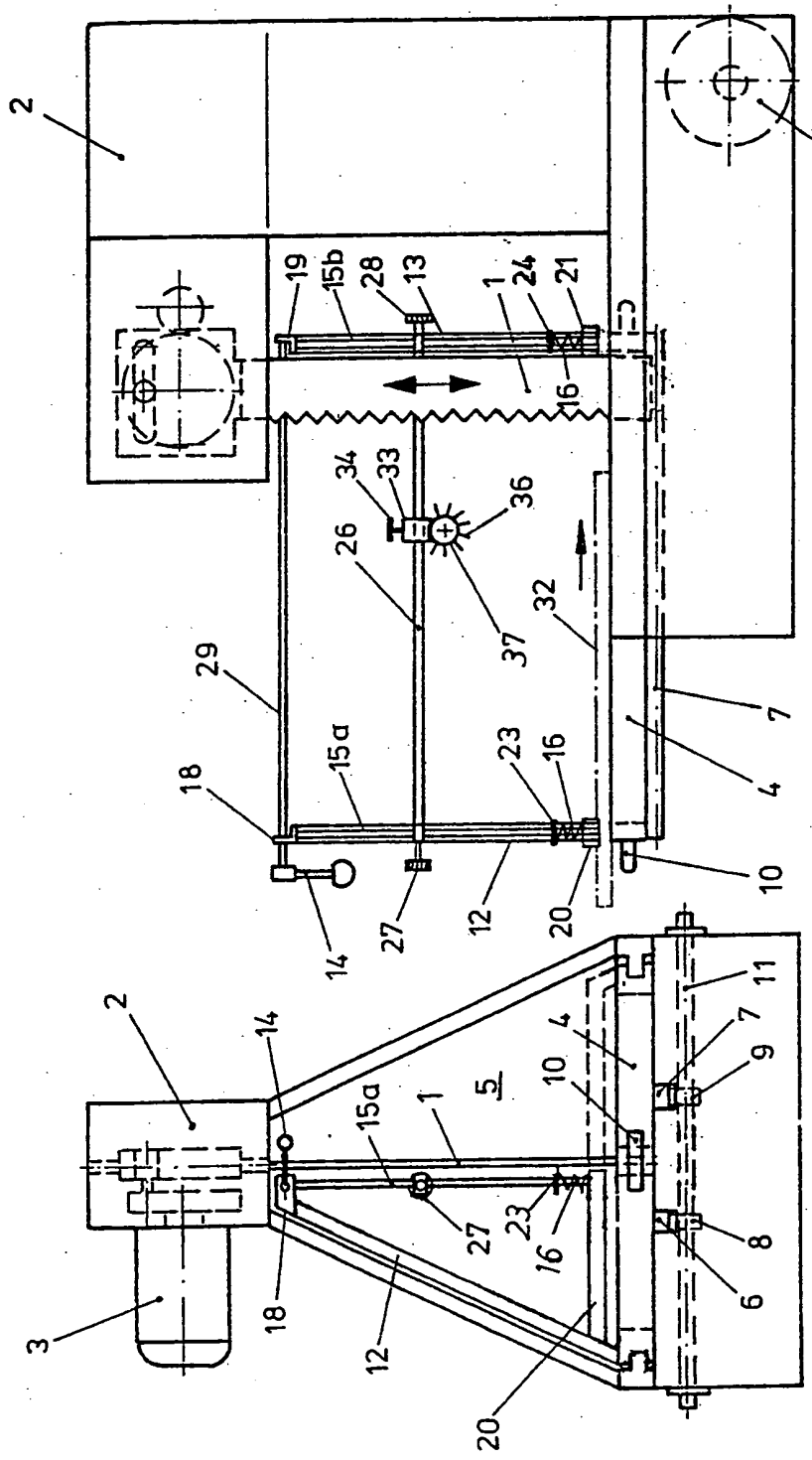
2
17
19
15b
28
13
1
24
21
16
34
33
36
26
37
32
29
7
4
18
15a
23
16
10
14
27
12
20
2
14
11
7
9
4
10
5
1
15a
27
23
16
8
6
3
18
12
20

Fig.2

Fig.1

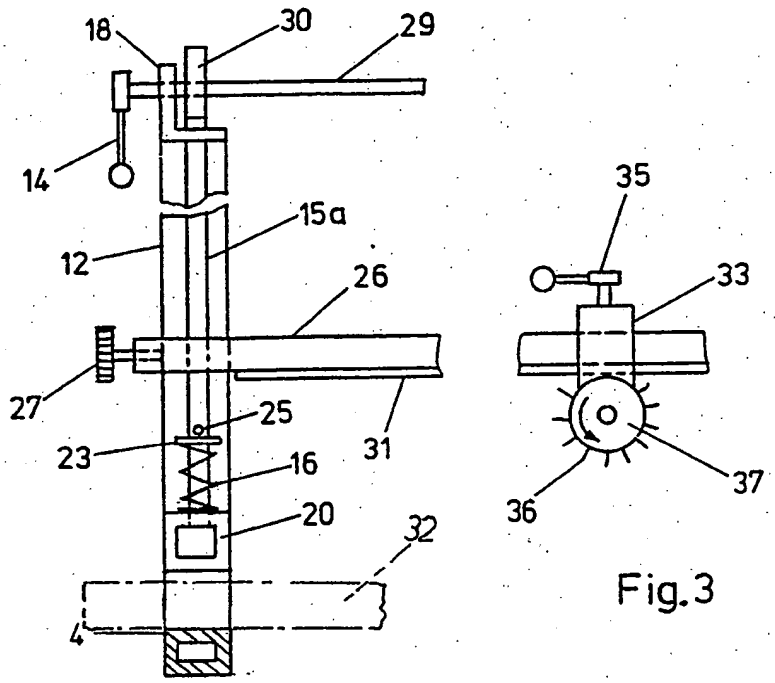
18
30
29
14
15a
12
26
27
25
23
16
31
20
32
4
35
33
36
37

Fig.3

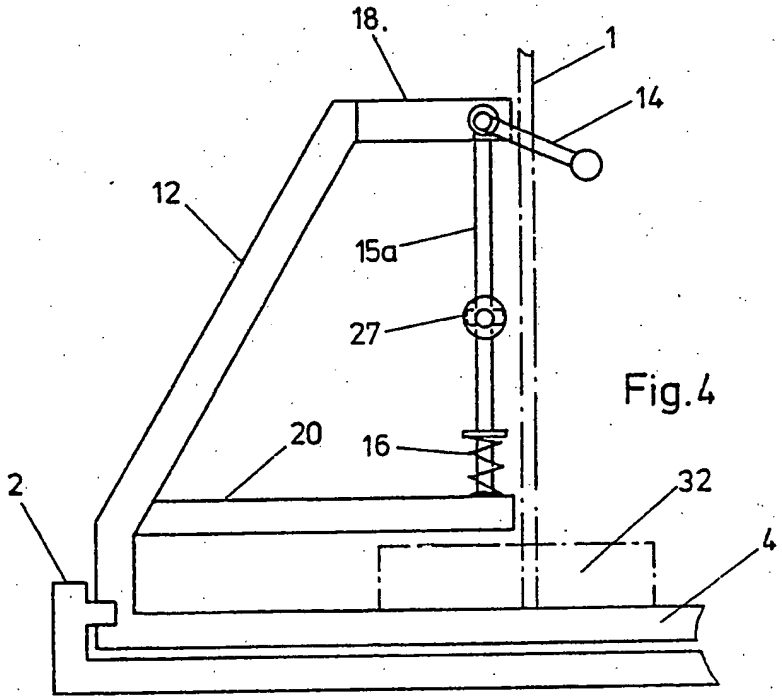
18.
1
14
12
15a
27
20
16
32
2
4

Fig.4

SPECIFICATION

Device for sawing materials

The invention relates to a device for sawing materials, especially building materials such as bricks, tiles, pipes, timber and the like.

On building sites, there is often a need for separating or reducing certain materials, or for providing them with recesses, cutouts, etc. This is, for instance, often the case at corners, in the window or door area and in the ceiling and gable region, where the height, width or length of the bricks used may have to be reduced. In the gable region, even angle cuts are required. In addition, there is often a need for cutting shuttering or covering boards to size, both in the longitudinal and in the transverse direction.

Up until now, lacking suitable equipment, bricks have been treated with a hammer and faults in the brickwork filled with chips. The result of this method was unacceptably high cold bridges, especially in the case of bricks having a layer of thermal insulation such as is the subject of DE-PS 1 708 765. A further drawback of this method was the increase of materials costs it caused. Bricks which were to be reduced in size tended to become unusable; they broke in the wrong place, resulting in a large number of useless fragments.

To counteract these drawbacks, DE-GM 77 02 782 recommends a saw for brick materials, This saw is, however, only suitable for bricks which are not too strong. Bricks of high strength cannot be cut with this machine. Furthermore, cutting with the saw blade, which is movable in a suitable fixing device, is a complicated and laborious process. The device is only conditionally suitable for cutting other materials, such as timber. Long boards, for instance, cannot be cut longitudinally. Nor is the clamping device for the bricks to be cut stable enough to absorb major forces.

It is therefore an object of the present invention to provide a sawing device suitable for universal use, with which longitudinal, transverse and, if necessary, angle cuts can be made on large or long components of different materials.

According to the present invention there is provided a device for sawing materials, especially building materials such as bricks, tiles, timber, pipes and the like, said device comprising a saw blade arrangement, and a supporting platform for the material to be cut which comprises a slide movable in a longitudinal direction the slide having clamping means comprising at least one support towards each of front and rear ends of the slide at one side of the blade arrangement, each support being linked to an upper and lower crosspiece the lower crosspieces being arranged at a vertical distance above the slide and between each pair of upper and lower crosspieces there is arranged a longitudinal bar the bars being movable in a vertical direction and carrying a clamping arrangement.

The materials to be cut are simply placed on the slide and secured there by clamping. For cutting, the slide is moved in the direction of cutting. This may be done by hand operation by way of a suitable transmission, by direct manual pushing of the slide or by a hydraulic or electric drive unit.

By designing the housing as a floor type unit, the saw blade being fitted to a forward extension at the top of the housing, and by providing an opening in the longitudinal direction, it is possible both to cut across long boards and to feed them through longitudinally. Since the lower crosspiece is arranged at a vertical distance above the slide and the two supports are fixed at the side to the front and rear parts of the slide, boards of any length can be cut. The only thing that is required is to feed in the boards longitudinally by hand, without operating the clamping device.

An embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings, in which:—

Figure 1 is a front view of the compass saw;

Figure 2 is a lateral view of the compass saw;

Figure 3 is an enlarged cutout of the clamping device (lateral view); and

Figure 4 is an enlarged cutout of the clamping device (front view).

The illustrations show a compass saw. This saw comprises a saw blade 1 mounted in an upper, freely projecting end of a floor type supporting structure 2 and driven by an electric motor 3, the rotary motion of which may, if required, also drive a hydraulic pump serving some hydraulic equipment, being converted into reciprocal motion by a gearbox here not illustrated in detail. The supporting structure 2 is provided with a slide 4 movable in the direction of cutting and used to feed in the material to be cut. The back end of the supporting structure (behind the saw blade 1) is completely open, thereby providing an opening, through which material can be pushed. Owing to the floor type construction of the unit, there is unlimited lateral space in the area of the saw blade. As a result of the above design of the supporting structure 2 and the slide 3, even long components such as boards can be placed on the slide 4 and cut.

For the feed movement of the slide, two racks 6 and 7 may be provided, these being arranged on the slide 4 and engaging two gears 8 and 9 mounted on a shaft 11 on the supporting structure 2. The slide 4 may, for instance, be moved by hand by means of a

handle 10 arranged on the slide 4 itself, or else by way of the shaft 11 on which the gears 8 and 9 are fitted. The shaft 11 may be turned by way of a suitable linkage with a handwheel or by a motor (not illustrated). Another possible alternative would be hydraulic control by means of a hydraulic cylinder.

The material to be cut is held on the slide 4 by means of a clamping device. The clamping device comprises supports 12 and 13 fitted towards respective ends of the slide 4 at one side of the saw blade 1. The supports have respective upper crosspieces 18, 19 and respective lower crosspieces 20 21 the lower crosspieces 20 and 21 being arranged at a vertical distance above the slide 4. This distance is so chosen as to allow the commonly used board sizes to be pushed through the gap thus created. Between the upper crosspieces 18, 19 and the respective lower crosspieces 20, 21 respective longitudinal bars 15*a* and 15*b* are arranged. The longitudinal bars 15*a* and 15*b* are capable of longitudinal movement in bores provided in the crosspieces. Between each lower crosspiece 20, 21 and a respective disc 23, 24 there is a spring 16. Each disc 23, 24 is fixed to the respective longitudinal bar 15*a* 15*b* by means of a split pin 25 extending through the longitudinal bar. This arrangement ensures a resilient mounting for the longitudinal bars 15*a* and 15*b* in the crosspieces. Between the two longitudinal bars 15*a* and 15*b*, at least one clamping rail 26 is provided. The clamping rail 26 is clamped to the longitudinal bars 15*a* and 15*b* by means of clamping screws 27 and 28.

Between the two upper crosspieces 18 and 19, there is further arranged a torsion bar 29 mounted in bores in the crosspieces. As can be seen in Fig. 3 , the torsion bar 29 is provided with two cams 30, each of them being arranged directly above the upper end of a respective one of the longitudinal bars 15*a*, 15*b*. The torsion bar 29 is further provided with a handle 14.

The clamping device operates as follows: the material to be cut is placed on the slide 4. Next, the clamping rail 26 is placed on the material. By tightening the clamping screws 27 and 28, the clamping rail is firmly fixed to the longitudinal bars 15*a* and 15*b*. Eccentric clamping action is initiated by means of the handle 14. When the torsion bar 29 is twisted, the cams 30, together with the clamping rail 26, press the bars 15*a* and 15*b* slightly downwardly against the force of the spring 16, thus securely clamping the material. On completion of the sawing operation, the spring 16 provides automatic release of the clamping device. In order to achieve an improved clamping effect, the clamping rail 26 could suitably be provided with an resilient support, such as a rubber piece 31, on its underside.

As can be seen in Figs. 3 and 4, a board 32—as indicated by a broken line—of any length required, can easily be pushed through the gap between the lower crosspieces 20, 21, and the slide 4. If this should become necessary in the interests of stability, the lower crosspiece 20 or 21 can be extended beyond the centre of the slide 4 and additional support could be provided at the other side of the slide 4 (indicated by a broken line in Fig. 1). Instead of a disc 23 to support the spring 26, it would of course be possible to provide a crosspin, a cam or a suitable shoulder of the longitudinal bar 15a.

In order to simplify the longitudinal cutting of timber, a rotatable roller 37 can be provided, which is clamped to the clamping rail 26. The roller 37 is so arranged that its axis is horizontal, extending at a right angle to the cutting plane. The roller can be secured to a suitable bracket 33 and thus to the clamping rail 26 by means of a clamping screw 34 as illustrated in Fig. 2 or by an eccentric clamping device 35 as illustrated in Fig. 3.

If, for instance, a long timber board is to be cut lengthwise, it only becomes necessary to lower the clamping rail 26 far enough to allow the roller 37 to rest on the board 32. For this purpose, the roller may additionally be equipped with a drive motor (not illustrated). In this way, the board 32 is transported automatically. This drive motor could for instance be an hydraulic drive unit connected by suitable hydraulic lines to a hydraulic pump, which would preferably be driven by the motor 3. To improve the feed of the material to be cut, the circumference of the roller 37 could be fitted with teeth, serrations 36 or the like.

The compass saw can be moved, if necessary, by means of a pair of extendable and retractable wheels 17 mounted in the support structure 2.

The saw blade 1 comprises a basic body, on which carbide cutting tips 24 are fitted by soldering, to cut during the downward stroke of the saw blade 1.

CLAIMS

1. A device for sawing materials, especially building materials such as bricks, tiles, timber, pipes and the like, said device comprising a saw blade arrangement, and a supporting platform for the material to be cut which comprises a slide movable in a longitudinal direction, the slide having clamping means comprising at least one support towards each of front and rear ends of the slide at one side of the blade arrangement, each support being linked to an upper and lower crosspiece the lower crosspieces being arranged at a vertical distance above the slide and between each pair of upper and lower crosspieces there is arranged a longitudinal bar the bars being movable in a vertical

direction and carrying a clamping arrangement.

2. A device according to claim 1, wherein the saw blade arrangement is mounted in a housing of a flow type design and having an opening in the longitudinal direction through which the material is fed.

3. A device according to claim 1 or 2, wherein the clamping means is provided with at least one horizontal clamping rail extending between the longitudinal bars, the clamping rail being secured to the longitudinal bars by means of respective clamping screws.

4. A device according to claim 3, wherein the clamping arrangement comprises a torsion bar mounted between the upper crosspieces and provided with an eccentric cam above an upper end of each longitudinal bar.

5. A device according to claims 3 or 4, wherein the underside of the clamping rail is provided with a resilient support.

6. A device according to any of the preceding claims, wherein each longitudinal bar is provided with a spring extending between the lower crosspiece and a disc connected to the longitudinal bar.

7. A device according to any of the preceding claims, wherein a rotatable roller with a horizontal axis extending at a right angle to the cutting plane is fitted to the clamping rail.

8. A device according to claim 7, wherein the roller is linked to a drive motor.

9. A device according to claim 8, wherein the drive motor is an hydraulic drive unit.

10. A device according to any of claims 7 to 9, wherein the circumference of the roller is provided with teeth, serrations or the like.

11. A device according to any of claims 7 to 10, when dependent on any of claims 3 to 5, wherein the roller is secured to the clamping rail.

12. A device for sawing materials, substantially as hereinbefore described with reference to the accompanying drawings.

13. Any novel subject matter or combination including novel subject matter herein disclosed, whether or not within the scope of or relating to the same invention as any of the preceding claims.

Printed for Her Majesty's Stationery Office
by Burgess & Son (Abingdon) Ltd.—1981.
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